

In the Claims:

1. (Currently Amended) A The detector system for detecting at least one chemical substance, the system being of the type comprising a measurement sensor (7) for selectively sensing the chemical substance to be detected, and a measurement unit (8) associated with the measurement sensor (7) for the purpose of being connected to a processor unit (9) to determine whether said chemical substance for detection is present or absent, the system being characterized in that the measurement system comprises at least one olfactory neuron (7) selected for selectively sensing the chemical substance to be detected, and in that the olfactory neuron (7) is secured to a support (3) in order to co-operate with the measurement unit (8).
2. (Currently Amended) A The detector system according to claim 1, in which the support (3) is covered at least in part in electrical insulation (10) on which the olfactory neuron (7) is secured.
3. (Currently Amended) A The detector system according to claim 2, in which the electrical insulation (10) comprises a polymer (10) also suitable for securing the olfactory neuron (7).
4. (Currently Amended) A The detector system according to claim 3, in which the polymer (10) is deposited on the support (3) electrochemically by dipping a reference electrode and at least a portion of the support (3) in a liquid electrolyte based at least on a salt and a solvent, and by bringing the support and the reference electrode to a potential that is not less than the oxidation potential of said solvent.
5. (Currently Amended) A The detector system according to claim 4, in which the solvent is selected from a pure saturated aliphatic primary diamine, a pure saturated aliphatic primary triamine, a saturated aliphatic amino-thiol, and a saturated aliphatic dithiol.
6. (Currently Amended) A The detector system according to ~~any one of the preceding claims~~ claim 1, in which the measurement unit (8) comprises at least one measurement electrode (82) and a reference electrode (81) in contact with the olfactory neuron (7), said measurement and reference electrodes (81, 82) being for connection to the processor unit (9).

7. (Currently Amended) A The detector system according to claim 6, in which the olfactory neuron (7) presents a cell body (71) which is extended on one side by dendrites (73) and on an opposite side by an axon (73) presenting a plasma membrane (70), and the measurement electrode (82) is disposed inside the plasma membrane (70) of the axon (73), while the reference electrode (81) is placed in contact with the surface of the plasma membrane (70) of said axon (73).
8. (Currently Amended) A The detector system according to ~~any one of the claims 1 to 5~~ claim 1, in which the measurement unit (8) comprises firstly emitter means (83) for emitting excitation light towards the olfactory neuron (7) to enable the excitation light to interact with the chemical substance to be detected in order to produce radiation for detection, and secondly reception means (84) for receiving the radiation for detection as emitted by the chemical substance, said reception means (84) being connected to the processor unit (9).
9. (New) The detector system according to claim 2, in which the measurement unit comprises firstly emitter means for emitting excitation light towards the olfactory neuron to enable the excitation light to interact with the chemical substance to be detected in order to produce radiation for detection, and secondly reception means for receiving the radiation for detection as emitted by the chemical substance, said reception means being connected to the processor unit.
10. (New) The detector system according to claim 3, in which the measurement unit comprises firstly emitter means for emitting excitation light towards the olfactory neuron to enable the excitation light to interact with the chemical substance to be detected in order to produce radiation for detection, and secondly reception means for receiving the radiation for detection as emitted by the chemical substance, said reception means being connected to the processor unit.
11. (New) The detector system according to claim 4, in which the measurement unit comprises firstly emitter means for emitting excitation light towards the olfactory neuron to enable the excitation light to interact with the chemical substance to be detected in order to produce radiation for detection, and secondly reception means for receiving the radiation for detection as emitted by the chemical substance, said reception means being

connected to the processor unit.

12. (New) The detector system according to claim 5, in which the measurement unit comprises firstly emitter means for emitting excitation light towards the olfactory neuron to enable the excitation light to interact with the chemical substance to be detected in order to produce radiation for detection, and secondly reception means for receiving the radiation for detection as emitted by the chemical substance, said reception means being connected to the processor unit.